Oral Presentation (AQ-3)

Profile Cortisol, Neutrophyle/Lymphocyte Ratio and IL-6 on Bali Cattle Transported by Traditional Vessel during 120 Hours

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INTRODUCTION

Transportation of livestock using wooden vessels is frequently used fulfilling the demand of another Province on Bali cattle. Cattle transportation arranged in the Office Internationale Epizooticae (OIE) and the Internatinal Air Transport Association (IATA) is highly susceptible to stress. This study aims to determine the profile of hormones cortisol, neutrophyle/lymphocyte ratio and IL-6 as stress indicator.

MATERIALS AND METHODS

All methods of this study were approved by Ethics Comission of the Integrated Research and Testing Laboratory, Universitas Gadjah Mada (LPPT UGM), under no 00096/04/LPPT/XI/2016.
*Animals:*Five female Bali's breed in1-2 years selected by purposive sampling that transported from Sumbawa to Pontianak for 120 hours using 100 GT traditional vessel with two floors and a capacity of 300-400 heads (Figure 1 and 2).

Figure 1. Traditional vessel "Setia Purnama". (Source: Panguji 2017)

Research design. Sampling was collected on four main stages, at the 8th day before transportation at Sumbawa Animal Quarantine Installation (IKH), loading, docking, and eight hours at IKH Pontianak.

Blood analysis. Serum was assayed using Enzym Linked Immunosorbent Assay (ELISA) method to determine concentration of cortisol and IL-6.Examinations of neutrophil/lymphocyte ratiowas obtained by comparing directly the percentage of neutrophil/lymphocyte.

Figure 2. Female Bali's breed in traditional vessel. (Source: Panguji 2017)

RESULT AND DISCUSSION

The results showed that the average concentration of cortisol before transport, when loading, when docked and after transportation were 78.21±27.96 ng/ml, 90.78±30.91 ng/ml, 69.90±53.92 ng/ml, 69.34±32.03 ng/ml. The average IL-6 concentration before transport, when loading, when docked and after transport were 259.86±70.16 ng/l, 315.41±64.21 ng/ml, 410.13±247.43 ng/ml, 424.81±98.86 ng/ml. The mean of N/L ratio concentration before transport, during loading, when docked and after transport were 0.88±0.28, 1.15±0.52, 1.26±0.43, 1.13±0.59 (Table 1). The results showed the transportation of female Balinese cows for 120 hours from Sumbawa to Pontianak using traditional vessels on the hormone profile of cortisol, IL-6 and N/L ratio showed fluctuating results but statistically did not show significant change ($p>0.05$).

N/L ratio when IKH Sumbawa and loading contains the same trend with cortisol concentration (Figure 3). Cortisol pattern and N/L ratio are almost the same, the increase in the N/L ratio follows the increase of cortisol [1]. N/L ratio docking increased than loading. This is very contrary to the fluctuations of cortisol in the blood. The hormone cortisol decreased first then followed

by the ratio of N/L [2]. Migration of lymphocytes from blood to peripheral in stress conditions occurs after an increase cortisol, therefore the N/L ratio that rises in the density is not a direct reaction due to the decrease of cortisol because hematological at the same time and not can be used as a comparison of the correlation between cortisol and N/L ratio. Fluctuating N/L ratio shows a tendency for acute stress which blood lymphocyte levels decrease as most lymphocytes are mobilized to peripheral organs such as skin.

Table 1. Mean and standard deviation of cortisol, IL-6 and the N / L ratio of each cow

Parameter	Cortisol	IL-6	N/L ratio
IKH Sumbawa	78.21±27.96[a]	259,86±70,16[a]	0,88±0.28[a]
Loading	90.78±30.91[a]	315.41±64.21[a]	1,15±0.52[a]
Docking	69.90±53.92[a]	410.13±247.43[a]	1.26±0.43[a]
IKH Pontianak	69.34±32.03[a]	424.81±98.86[a]	1.13±0.59[a]

Description: Superscripts (a) show insignificant (p>0.05)

N/L ratio and cortisol concentrations tend to decrease at IKH Pontianak. This profile is consistent with the trend of decreased cortisol levels in blood and N/L ratio and reinforces the indication that the adaptation process can reduce stress levels [2].

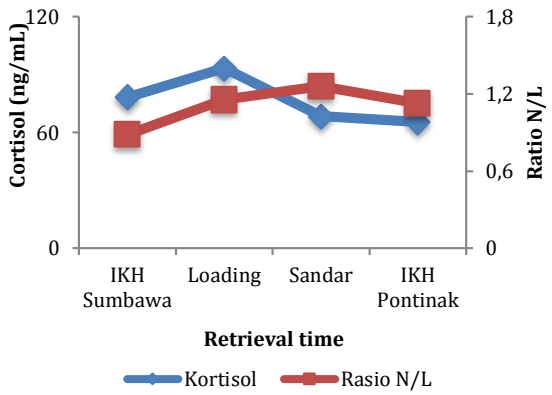

Figure 3. Average cortisol and N/L ratio

Descriptively, concentration of IL-6 and cortisol showed the same trend when loading compared to IKH Sumbawa (Figure 4). After heat stress during loading, the concentrations of cortisol and IL-6 increased.

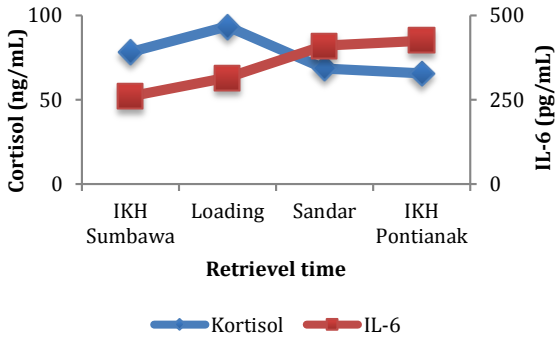

Figure 4. Average cortisol and IL-6 rate

When docking occurred in the morning, the concentration of IL-6 increased but cortisol showed a decrease. The IL-6 fluctuation contradicts the pattern of cortisol hormone changes in the blood (Figure 4), because the diurnal rhythm of IL-6 is influenced by the glucocorticoid hormone. Increased concentrations of IL-6 may be due to an increase in cortisol at night [3]. Short-term transport stress may stimulate the concentrations of ACTH, cortisol, IL-6, and TNF-α as immune cytokines, but transport over a long period of time will lead to immunosuppression [4].

CONCLUSION

Transportation by traditional vessel transportation still apply animal welfare rules in terms of cortisol hormone profile.

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